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UNMANNED AIRCRAFT SYSTEMS

Advance Coordination and Increased Visibility Needed to Optimize Capabilities

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Why GAO Did This Study

Combatant commanders carrying out ongoing operations rank the need for intelligence, surveillance, and reconnaissance (ISR) capabilities as high on their priority lists. The Department of Defense (DOD) is investing in many ISR systems, including unmanned aircraft systems (UAS), to meet the growing demand for ISR assets to support the warfighter. GAO was asked to evaluate DOD's efforts to integrate UAS into ongoing operations while optimizing the use of all DOD ISR assets. Specifically, this report addresses the extent that (1) DOD has taken steps to facilitate the integration of UAS into combat operations, and (2) DOD's approach to allocating and tasking its ISR assets considers all available ISR capabilities, including those provided by UAS. GAO also reviewed the extent that DOD evaluates the performance of its ISR assets, including UAS, in meeting warfighters' needs. To perform this work, GAO analyzed data and guidance on the use of ISR assets, and interviewed DOD officials, including those supporting ongoing operations in Iraq and Afghanistan.

What GAO Recommends

GAO is recommending actions to improve DOD's ability to coordinate the deployment of its UAS and other ISR assets, consider the availability of all ISR assets in allocating and tasking them, and evaluate the performance of its ISR assets. DOD generally concurred with our recommendations.

www.gao.gov/cgi-bin/getrpt?GAO-07-836.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Sharon Pickup at (202) 512-9619 or pickups@gao.gov.

What GAO Found

DOD components have developed guidance to facilitate the integration of UAS into combat operations; however, further steps are needed to coordinate the deployment of these assets. For example, DOD developed guidance for the tactical employment of UAS and a Joint UAS Concept of Operations. This guidance is an important first step but does not address coordinating UAS and other ISR assets prior to deploying them to ongoing operations, which U.S. Central Command recognized is a critical factor in integrating UAS into combat operations. Until DOD addresses the need for DOD-wide advance coordination, it may continue to face challenges in successfully integrating UAS and other ISR assets into combat operations and may exacerbate integration challenges such as limited bandwidth.

DOD's approach to allocating and tasking its ISR assets, including UAS, hinders its ability to optimize the use of these assets because it does not consider the capabilities of all available ISR assets. The command charged with recommending how theater-level DOD ISR assets should be allocated to support operational requirements does not have awareness of all available ISR assets because DOD does not have a mechanism for obtaining this information. Similarly, the commander responsible for coordinating ongoing joint air operations does not have information on how assets controlled by tactical units are being used or what missions they've been tasked to support. Nor do tactical units have information on how theater-level assets and ISR assets embedded in other units are being tasked, which results in problems such as duplicative taskings. This lack of visibility occurs because DOD does not have a mechanism for tracking the missions both theater- and tactical-level ISR assets are supporting or how they are being used. Without an approach to allocation and tasking that includes a mechanism for considering all ISR capabilities, DOD may be unable to fully leverage all available ISR assets and optimize their use.

DOD is unable to fully evaluate the performance of its ISR assets because it lacks a complete set of metrics and does not consistently receive feedback to ensure the warfighter's needs were met. Although the Joint Functional Component Command for ISR has been tasked with developing ISR metrics, DOD currently assesses its ISR missions with limited quantitative metrics such as the number of targets planned versus captured. While these metrics are a good start, DOD officials acknowledge that the current metrics do not capture all of the qualitative considerations associated with measuring ISR asset effectiveness such as the cumulative knowledge provided by numerous ISR missions. There is an ongoing effort within DOD to develop additional quantitative as well as qualitative ISR metrics, but no DOD-wide milestones have been established. Furthermore, DOD guidance calls for an evaluation of the results of joint operations; however, DOD officials acknowledge that this feedback is not consistently occurring due to the fast pace of operations in theater. Without metrics and feedback, DOD may not be able to validate how well the warfighters' needs are being met, whether it is optimizing the use of existing assets, or which new systems would best support warfighting needs.

United States Government Accountability Office

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Washington, DC 20548

July 11, 2007

The Honorable Neil Abercrombie
Chairman
The Honorable Jim Saxton
Ranking Member
Subcommittee on Air and Land Forces
Committee on Armed Services
House of Representatives

Ongoing military operations in Iraq and Afghanistan are being transformed
by new intelligence, surveillance, reconnaissance (ISR), and strike
capabilities, some of which have been achieved through the use of
unmanned aircraft systems (UAS). Effective ISR can provide early warning
of enemy threats and precision targeting, as well as enable U.S. military
forces to increase effectiveness, coordination, and lethality. ISR data can
come from a variety of sources, including surveillance and reconnaissance
systems such as satellites; manned aircraft like the U-2; unmanned aircraft
systems like the Air Force's Global Hawk and Predator and the Army's
Hunter; other ground, air, sea, or space-based equipment; and human
intelligence teams.

Combatant commanders carrying out ongoing operations are supported by
the Department of Defense's (DOD) ISR assets, including theater-level ISR
assets that are generally used to support combatant commander ISR
priorities, tactical ISR assets that are generally used to support operational
units including conventional and special operations forces, and assets
acquired by the Joint Improvised Explosive Device Defeat Organization to
aid in the identification and elimination of improvised explosive devices.
Additionally, combatant commanders receive support from ISR assets
controlled by U.S. intelligence agencies such as the National Security
Agency, the National Reconnaissance Office, and the National Geospatial-
Intelligence Agency. U.S. allies also provide ISR assets to support ongoing
combat operations.

Battlefield commanders rank the need for ISR systems and the information
they produce as high on their priority lists, a fact that is reflected in DOD's
planned investment in ISR. The demand for ISR assets at every level of
command is growing, and DOD is making investments in a number of ISR
systems, including unmanned aircraft systems, manned platforms, and
space-borne, maritime, and terrestrial systems. Specifically, for UAS,

funding has increased from $363 million in fiscal year 2001 to $2.23 billion in fiscal year 2007, and DOD has requested $2.54 billion for fiscal year 2008.[1] As of February 2007, DOD had more than 3,900 unmanned aircraft in its inventory[2] compared to fewer than 50 in 2000. The majority of these aircraft are currently being used in support of ongoing operations in Iraq and Afghanistan.

In December 2005, we reported that while commanders are experiencing mission success with UAS in ongoing operations, they face challenges in fully optimizing the use of these assets, due in part to the growing number of UAS.[3] Specifically, we reported that DOD had achieved operational successes with UAS, but challenges such as interoperability and limited communications bandwidth were hampering joint operations or preventing timely UAS deployment. Additionally, in April 2006, we testified that while DOD continues to request funds to support service plans for acquiring UAS, it lacks a viable strategic plan to guide UAS development and investment decisions.[4]

You asked us to review DOD's efforts to integrate UAS into ongoing combat operations while optimizing the capabilities offered by all DOD ISR assets. Specifically, we assessed the extent to which (1) DOD has taken steps to facilitate the integration of UAS into combat operations; and (2) DOD's approach to allocating and tasking its ISR assets considers all available ISR capabilities, including those provided by UAS. We are also providing information on the extent to which DOD evaluates the performance of its ISR assets, including UAS, in meeting the warfighters' needs.

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[1]Figures include procurement, operations and maintenance, and research, development and evaluation funding provided through DOD's regular appropriations and do not include funding provided in supplemental appropriations.

[2]This number represents the number of unmanned aircraft including test and training assets, rather than unmanned aircraft systems, which include aircraft, sensors, communications equipment, and ground control stations.

[3]GAO, *Unmanned Aircraft Systems: DOD Needs to More Effectively Promote Interoperability and Improve Performance Assessments*, GAO-06-49 (Washington, D.C.: Dec. 13, 2005).

[4]GAO, *Unmanned Aircraft Systems: Improved Planning and Acquisition Strategies Can Help Address Operational Challenges*, GAO-06-610T (Washington, D.C.: Apr. 6, 2006).

To address our objectives, we reviewed DOD and military service publications and documentation pertaining to ISR, including those specific to UAS such as joint publications, concepts of operations, manuals on tactics and procedures, and the 2005–2030 UAS Roadmap. We also interviewed officials from the Unmanned Aircraft Systems Planning Task Force within the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics; the Joint Staff; each of the military services; U.S. Central Command (CENTCOM) and associated Army and Air Force component commands; and the Joint Functional Component Command for Intelligence, Surveillance, and Reconnaissance (JFCC-ISR). Further, we reviewed documentation, such as joint publications and briefings that explain the process for tasking ISR assets, and interviewed officials at CENTCOM to better understand how ISR assets are assigned to specific missions. Additionally, we discussed the use of UAS in military operations with Combined Air Operations Center officials in Qatar and units that recently returned from or are currently supporting ongoing operations in Iraq and Afghanistan. To understand how requests for ISR support are generated and satisfied at the tactical level, we spoke with units that recently returned from, or are currently supporting, ongoing operations in Iraq and Afghanistan as well as units within the services such as the Marine Corps' Tactical Fusion Center that are involved in determining if tactical assets are available to satisfy those requests or if the requests need to be forwarded for theater-level support. We performed our work from June 2006 to June 2007 in accordance with generally accepted government auditing standards. More details on our scope and methodology are presented at appendix I.

In addition to this report, we recently issued a report that discussed whether DOD is acquiring its ISR assets in the most efficient manner. We are also conducting work for the committee examining how DOD determines its requirements for ISR systems and expect to report on this work early next year.

Results in Brief

DOD components have developed guidance to facilitate the integration of UAS into combat operations; however, further steps are needed to fully coordinate the deployment of these assets. For example, DOD developed a Multi-Service Tactics, Techniques, and Procedures for the Tactical Employment of Unmanned Aircraft Systems and a Joint Concept of

Operations for Unmanned Aircraft Systems.[5] This guidance represents an important first step for the use of UAS in combat operations and DOD officials acknowledge these documents will continue to evolve as DOD learns more about the capabilities of UAS and other ISR assets and their application in combat operations. However, the guidance does not address, on a DOD-wide basis, the issue of advance coordination, which CENTCOM has recognized is a critical factor in integrating UAS into combat operations by enabling efficient deployment and utilization of assets and by allowing the combatant commander time to plan to support incoming assets. In the absence of such guidance, CENTCOM has established procedures for the services to coordinate system requirements prior to ISR assets arriving into CENTCOM's theater of operations. These procedures apply only to CENTCOM's theater of operations. However, we found that CENTCOM's procedures for advance coordination were not always followed because the services indicated that they were not aware of the requirement. According to CENTCOM officials, they distributed these procedures to each of CENTCOM's service components, such as Central Command Air Forces and U.S. Naval Forces Central Command, but were not aware if they were distributed further, and the service officials we interviewed were not aware of the requirement. As a result of this lack of advance coordination, CENTCOM is not always aware, on a timely basis, of assets entering theater, which can potentially exacerbate existing operational challenges such as limited interoperability and communications bandwidth. While this example is limited to CENTCOM, the potential exists for DOD to need to establish operations in other areas of the world very quickly. A DOD-wide procedure for advance coordination is critical to enable DOD to quickly support UAS and other ISR assets once deployed to support these operations. Until DOD takes steps to address the need for DOD-wide advance coordination, it may continue to face challenges in successfully integrating UAS and other ISR assets into combat operations and may exacerbate existing integration challenges such as the lack of interoperability and limited bandwidth. Therefore, we are recommending that the Secretary of Defense, in conjunction with the service secretaries and combatant commanders, establish DOD-wide requirements for coordination in advance of introducing ISR assets into theater; develop a plan for communicating

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[5]The Multi-Service Tactics, Techniques, and Procedures for the Tactical Employment of Unmanned Aircraft Systems was prepared under the direction of representatives from the Army, Navy, and Air Force for use by their respective commands and other commands as appropriate. The Joint Concept of Operations for UAS was prepared under the direction of the Chairman of the Joint Chiefs of Staff.

those requirements throughout DOD; and establish a mechanism to ensure the services comply with these requirements. DOD generally concurred with this recommendation. DOD noted that it currently has a well-defined process to coordinate with the combatant commanders on the introduction of UAS into theater and cited several examples including the annual process for allocating theater-level UAS, and actions between stateside units and units in theater to plan for deployment of ISR capabilities. DOD, however, acknowledged that a more standardized method could improve efficiency of the coordination process and stated that the Joint Chiefs of Staff would be tasked to look at standardizing the coordination process and evaluate and provide direction for an improved coordination process. Further, DOD noted that, based on this evaluation, if direction is required, it will be issued via a Chairman's directive which is mandatory and therefore establishes the mechanism that ensures compliance. We recognize that DOD has various processes related to UAS but note that none, including the examples cited by DOD, represent a standardized, DOD-wide approach that the services and combatant commanders can follow in coordinating the specific details of deploying UAS assets, regardless of geographic area. Furthermore, we believe that a directive requiring coordination, by itself, does not ensure compliance, and would encourage DOD to include provisions detailing how implementation of the directive will be monitored.

DOD's current approach to allocating and tasking DOD's ISR assets, including UAS, hinders its ability to optimize the use of DOD's ISR assets because it does not consider the availability of all ISR assets in determining how best to meet warfighting needs. The Joint Functional Component Command for Intelligence, Surveillance, and Reconnaissance (JFCC-ISR), which is charged with recommending to the Secretary of Defense how theater-level DOD ISR assets should be allocated to support the operational requirements of combatant commanders, has an awareness of, or visibility into, most DOD ISR assets, but it does not have an awareness of all ISR assets available to support the combatant commanders, such as assets that are owned and controlled by U.S. national intelligence agencies such as the National Security Agency or by our allies supporting ongoing operations. According to JFCC-ISR officials, although they are working to gain better visibility over all ISR assets, they currently do not have this level of visibility. DOD does not currently have a mechanism for obtaining information on all ISR assets, including all DOD, national, and allied assets, operating in each of the combatant commanders' area of operations. Absent a mechanism, JFCC-ISR has been trying to learn more about the capabilities of non-DOD ISR assets by building relationships with other national and allied intelligence agencies

and addressing limitations related to intelligence agency system access. Similarly, during ongoing operations, the Joint Forces Air Component Commander (JFACC), who is responsible for planning, coordinating, and monitoring joint air operations, does not have information on how tactical assets embedded in and controlled by tactical units are being used on a daily basis or what missions they have been tasked to support. Nor do tactical units have information on how theater-level assets and ISR assets embedded in other units are being tasked. DOD does not currently have a mechanism for tracking the missions both theater and tactical-level ISR assets are supporting or how they are being used on a daily basis. This lack of visibility at all levels into how ISR assets are being tasked could result in unnecessary duplicative taskings and limit DOD's ability to leverage all available ISR assets. DOD recognizes the opportunity to better plan for and control its ISR assets and has initiated a study to assess this, but this study is not expected to be completed until August or September 2007. Without an approach to its allocation and tasking processes that considers all ISR capabilities, DOD may not be in a sound position to fully leverage all the capabilities of available ISR assets and to optimize the use of those assets, and therefore cannot be assured that it is addressing warfighter needs in the most efficient and effective manner. To provide greater visibility into the availability and use of ISR assets, including UAS, we are recommending that the Secretary of Defense develop a mechanism to gain information on all available ISR capabilities, where they are operating, and how they are being used. DOD generally concurred with this recommendation. DOD agreed that a mechanism for obtaining information on all ISR assets is needed and commented that work is underway to develop such a mechanism. DOD also stated that it is not currently practical to provide situational awareness on some UAS, such as the small, hand-launched UAS at the lowest operational level because of technological limitations. It noted it will determine the operational levels that will provide widespread situational awareness. We recognize that obtaining situational awareness may not currently be practical for some UAS but would encourage the department to seek to maximize coverage in exploring options for improved situational awareness.

DOD is unable to fully evaluate the success of its ISR missions because it lacks a complete set of metrics and does not consistently receive feedback from operators and intelligence analysts to ensure the warfighter's needs were met. Although the JFCC-ISR has been tasked with developing metrics and standards of performance to assess DOD ISR mission accomplishment, DOD evaluates its ISR missions with limited quantitative metrics such as the number of targets planned versus the number of targets collected. While these metrics are a good start, DOD officials

acknowledge that the current metrics do not take into account all of the qualitative considerations associated with measuring ISR asset effectiveness, such as the cumulative knowledge provided by numerous ISR missions, or provide insight on how the intelligence collected contributed toward accomplishment of the mission. JFCC-ISR is working with the combatant commanders to develop additional quantitative ISR metrics as well as qualitative metrics to evaluate the performance of ISR collection assets, but no DOD-wide milestones have been established. Milestones would include the required steps and planned dates for completion of those steps leading up to metrics development. Furthermore, Joint Publication 2-01 calls for intelligence personnel and consumers to evaluate and provide immediate feedback on how well intelligence operations perform to meet commander's intelligence requirements; however, DOD officials acknowledge that this feedback is not consistently occurring due, mainly, to the fast pace of operations in theater. Without feedback and metrics for evaluating ISR assets, DOD may not be in the best position to validate how well the warfighter needs are being met, the true demand for ISR assets, and whether it is optimizing the use of existing assets, or which new systems DOD should acquire in order to best support warfighting needs. To improve DOD's ability to evaluate the effectiveness of its ISR missions, we recommend DOD establish DOD-wide milestones for metrics development, develop a process for systematically capturing feedback on how effective ISR assets are in meeting warfighter requirements and consider this information when making ISR acquisition, allocation, and tasking decisions. DOD generally concurred with this recommendation. DOD agreed milestones for development of ISR metrics should be established, but pointed out that organizations within the department collect feedback or conduct lessons learned studies. While the feedback captured by those organizations is noteworthy, it is often not immediate or specific to individual missions. DOD further commented that it has mechanisms in place to inform its decision-making processes on the acquisition, allocation, and tasking of its ISR assets such as the Joint Capabilities Integration and Development System which assesses, among other things, capability gaps and solutions. We agree that the mechanisms mentioned in DOD's response exist; however, DOD currently does not have sufficient qualitative and quantitative metrics needed to collect data on UAS performance nor does it have a means for incorporating such data into the processes currently used to make decisions on ISR assets.

Background

UAS represent one of many DOD airborne ISR assets available to support ongoing combat operations. Unmanned aircraft are deployed and

controlled at different levels of command and can be categorized into three main classes: man-portable, tactical, and theater. Table 1 illustrates examples of UAS in each category. Man-portable UAS are small, self-contained, and portable and are generally used to support the small ground combat teams in the field. Tactical UAS are larger systems that are generally used to support operational units at tactical levels of command such as the battalion or brigade. Tactical UAS are locally operated and controlled by the units. Theater UAS are operated and controlled by the Joint Forces Air Component Commander (JFACC) and are generally used to support combatant commander ISR priorities, although in certain circumstances they can be assigned to support tactical operations, such as when troops are being fired on. Theater UAS traditionally have been more capable than tactical or man-portable systems. For example, theater UAS typically contain characteristics that make them more capable than other categories of UAS, such as their more robust communications architecture and more capable payloads that allow for production of more diverse intelligence data products. However, some tactical systems, such as the Army's Warrior UAS, are being developed that are capable of performing theater-level requirements and, as currently envisioned, will be embedded in and controlled at the tactical level by units.

Table 1: UAS Nomenclature/Characteristics

	Maximum altitude (feet)	Maximum endurance (hours)[a]
Man-portable UAS		
Dragon Eye	500 AGL[b]	1
Raven	1,000 AGL	1
Tactical UAS		
Hunter	15,000 MSL[c]	8-9
Shadow	15,000 MSL	5
ERMP (Warrior)	29,000 MSL	36
Theater UAS		
Predator	26,000 MSL	20
Global Hawk	60,000 MSL	28

Source: DOD.

[a]Endurance equals total time from takeoff to landing.

[b]AGL is feet above ground level.

[c]MSL is feet above mean sea level.

DOD uses an annual process for allocating or distributing available DOD theater-level airborne ISR assets, including UAS, to the combatant commanders. The allocation process is managed by U.S. Strategic Command's Joint Functional Component Command for Intelligence, Surveillance and Reconnaissance (JFCC-ISR). In 2003, DOD altered its unified command plan to give U.S. Strategic Command responsibility for planning, integrating, and coordinating ISR in support of strategic and global operations. To execute this responsibility, U.S. Strategic Command established the JFCC-ISR in March 2005. The JFCC-ISR is charged with recommending to the Secretary of Defense how DOD's theater-level ISR assets should be allocated, or distributed, among combatant commanders and for the integration and synchronization of DOD, national, and allied ISR capabilities and collection efforts.

Once DOD's ISR assets are allocated to the combatant commanders, they are available to be assigned or tasked based on combatant commander priorities against specific missions in support of ongoing operations. Authority for tasking ISR assets, including UAS, is generally determined by the level of the objective the asset is deployed to support and the command level of the unit that controls the asset. Therefore, most theater-level UAS assets that are controlled and tasked by the JFACC are generally used to support theater-level objectives and priorities, as established by the combatant commander. Most tactical UAS assets controlled by the services or the U.S. Special Operations Command are used to support tactical objectives and priorities, which may differ from theater-level priorities. For example, authority to task the Army's Hunter resides with the commander of the unit in which it is embedded, whereas authority for tasking the Air Force's Predator resides with the JFACC.

In August 2005 DOD issued its current UAS Roadmap which was developed to assist DOD in developing a long-range strategy for UAS development, acquisition, and other planning efforts as well as to guide industry in developing UAS related technology. According to DOD officials, DOD is in the process of developing an update to this Roadmap and expects to issue the updated version in late summer 2007. The UAS Roadmap is intended to guide UAS planning; however, it does address limited operational aspects such as operational issues or challenges that have emerged as a result of operating UAS in support of ongoing operations. For example, the Roadmap acknowledges that the limited number of bandwidth frequencies constrains DOD's ability to operate multiple unmanned aircraft simultaneously.

DOD Has Taken Steps to Facilitate the Integration of UAS, but Further Steps Are Needed to Address Integration Challenges

DOD components have developed guidance—such as a Multi-Service Tactics, Techniques, and Procedures for the Tactical Employment of Unmanned Aircraft Systems and a Joint Concept of Operations for UAS—to facilitate UAS integration. However, DOD continues to face UAS integration challenges, such as the lack of interoperability and limited communications bandwidth. These challenges may be exacerbated because DOD has not established DOD-wide advance coordination procedures for integrating UAS into combat operations. Until DOD takes steps to address the need for DOD-wide advance coordination, it may continue to face challenges in successfully integrating UAS into combat operations and may exacerbate existing integration challenges.

DOD Has Developed Guidance to Facilitate the Integration of UAS

DOD components have developed guidance to facilitate the integration of UAS into combat operations. For example, in August 2006 DOD issued its Multi-Service Tactics, Techniques, and Procedures for the Tactical Employment of Unmanned Aircraft Systems. This document was designed to serve as a planning, coordination, and reference guide for the services and provides a framework for warfighters employing UAS. Furthermore, in March 2007 DOD issued its Joint Concept of Operations for Unmanned Aircraft Systems, which provides overarching principles, a discussion of UAS capabilities, operational views, and a discussion of UAS use in various operational scenarios. Each of the above documents represent an important first step for the use of UAS in combat operations, and DOD officials acknowledge these documents will continue to evolve as DOD learns more about the capabilities of UAS and their application in combat operations.

DOD Continues to Face UAS Integration Challenges

DOD continues to face challenges, such as interoperability and communications bandwidth, in integrating UAS into combat operations. In December 2005 we reported that challenges such as the lack of interoperability and limited communications bandwidth have emerged to hamper recent joint operations or prevent timely UAS employment.[6] Specifically, some UAS cannot easily exchange data, sometimes even within a single service, because they were not designed with interoperable communications standards. Additionally, as we previously reported, U.S. forces are unable to interchangeably use some payloads from one type of UAS on another, a capability known as "payload commonality."

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[6]GAO-06-49.

Furthermore, electromagnetic spectrum frequencies, often referred to as bandwidth, are congested by a large number of UAS and other weapons or communications systems using the same frequency simultaneously. While some UAS can change to different, less congested, frequency bands, most UAS were built without the ability to change frequency bands. Thus, commanders have had to delay certain missions until frequency congestion cleared. DOD is taking steps to address these challenges such as equipping UAS with the Tactical Common Data Link[7] and, according to DOD officials, it is developing common ground control stations to improve interoperability of its UAS.

Lack of DOD-wide Advance Coordination May Exacerbate Integration Challenges of UAS and Other ISR Assets

Existing UAS integration challenges may be exacerbated because DOD has not established DOD-wide advance coordination procedures for integrating UAS and other ISR assets into combat operations. Specifically, DOD officials indicate that assets arriving in theater without advance coordination may exacerbate UAS integration challenges, such as further taxing the limited available bandwidth. As additional ISR assets are rapidly acquired and fielded to meet the increasing demand for ISR support in ongoing operations, CENTCOM has recognized that advance coordination is a critical factor in integrating UAS into combat operations by enabling efficient deployment of assets and effective utilization of them once they are in theater. Furthermore, advance knowledge of system requirements is crucial to allow the combatant commander sufficient time to adequately plan to support incoming assets. DOD officials acknowledge that having to incorporate assets quickly into the theater infrastructure creates additional challenges and further emphasizes the need for advance coordination.

In response to this issue, CENTCOM has developed procedures to ensure the services coordinate their plans prior to deploying UAS to CENTCOM's theater of operations. In May 2005 CENTCOM established the Concept of Operations for Employment of Full Motion Video Assets, which states that

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[7]The National Defense Authorization Act for Fiscal Year 2006, Pub. L. No. 109-163 § 141 (2006), required that the Secretary of Defense take such steps to ensure that all service tactical unmanned aerial vehicles (except those for which the Under Secretary of Defense for Acquisition, Technology, and Logistics has waived this requirement through the procedures outlined in the Act) are equipped and configured so that the data link used is the Tactical Common Data Link and those vehicles use data formats consistent with the architectural standard for tactical UAS. Use of the tactical common data link will allow UAS to be programmed to a wider range of frequencies, thus reducing dependence on the currently congested frequencies such as C band.

when a full-motion video-capable asset[8] or weapons system is scheduled for deployment to CENTCOM's theater of operations, the controlling unit will notify CENTCOM of the deployment no later than 30 days prior to arrival of the asset in theater. It also states that the controlling unit will provide a system and platform concept of operations to CENTCOM no later than 15 days prior to the asset's arrival. According to CENTCOM officials, they distributed these procedures to each of CENTCOM's service components, such as Central Command Air Forces and U.S. Naval Forces Central Command. However, they were unaware if the procedures were distributed further to the services, and service officials we interviewed, including those at the service Headquarters as well as those stationed within units returning from ongoing operations, indicated they were not aware of the requirement. CENTCOM officials indicate that the procedures have not always been followed.

The Warrior Alpha, which was fielded by the Joint Improvised Explosive Device Defeat Organization and operated by the Army to aid in the identification and elimination of improvised explosive devices, illustrates why this advance coordination is so critical. As a result of coordinating with CENTCOM, the Army was made aware of limitations such as bandwidth and limited ramp space and decided to deploy the Warrior Alpha to an alternate location. While CENTCOM and Army officials disagree on whether the coordination was completed in a timely manner, all agree it was ultimately completed. While this example is limited to CENTCOM's area of operations, the potential exists for DOD to have to quickly establish operations in other areas of the world, which makes the need for advance coordination even more critical.

CENTCOM officials acknowledge the need for advance coordination for all ISR assets entering CENTCOM's theater of operations, not just those assets that are capable of full-motion video. To address this need, CENTCOM developed in November 2006 an ISR Systems Concept of Operations Standardization Memo. CENTCOM officials stated that the ISR memo is intended to provide CENTCOM with awareness of what assets are coming into theater and to allow CENTCOM to ensure the asset is able to be incorporated into the existing infrastructure, given operational challenges such as limited communications bandwidth. This memo requires the inclusion of certain elements in all ISR system concepts of

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[8]A full-motion video–capable asset has the capability to collect and transmit real-time full-motion video imagery.

operations, including how the asset will be tasked; how intelligence will be processed, exploited, and disseminated; and system bandwidth requirements that must be coordinated with CENTCOM prior to deployment of ISR assets.

This ISR memo applies only to CENTCOM's theater of operations and does not constitute DOD-wide guidance. While the Warrior Alpha example is limited to CENTCOM, the potential exists for DOD to need to establish operations in other areas of the world very quickly. A DOD-wide procedure for advance coordination would be critical for quickly supporting UAS and other ISR assets once deployed. Until DOD takes steps to address the need for DOD-wide advance coordination, it may be unable to successfully integrate UAS and other ISR assets into combat operations and existing integration challenges may be exacerbated.

DOD's Approach to Allocating and Tasking UAS and Other ISR Assets Does Not Consider the Capabilities of All ISR Assets

DOD's current approach to allocating and tasking its ISR assets, including UAS, does not consider the capabilities of all ISR assets because it lacks an awareness or visibility over all ISR capabilities available to support the combatant commanders and how DOD ISR assets are being used, which hinders DOD's ability to optimize the use of its assets. Although DOD has established a process for allocating available DOD ISR assets, including UAS, to the combatant commanders to meet their needs, it does not have an awareness of all ISR assets, which impairs its ability to distribute or allocate DOD assets while considering the capabilities of all ISR assets. Additionally, DOD's process for tasking its ISR assets does not currently allow for information at all levels into how DOD's ISR assets are being used on a daily basis, which hinders its ability to leverage other assets operating in an area and to avoid unnecessary duplicative taskings. Without an approach to its allocation and tasking processes that considers all ISR capabilities, DOD is not in a sound position to fully leverage all the capabilities of available ISR assets and to optimize the use of those assets, and therefore cannot be assured that it is addressing warfighter needs in the most efficient and effective manner. DOD recognizes the opportunity to better plan for and control its ISR assets and has initiated a study to examine the issue.

DOD Does Not Have Visibility over All ISR Assets Available to Meet the Warfighters' Needs

Although DOD has established a process for allocating available DOD ISR assets to the combatant commanders to meet the warfighters' needs, it does not have an awareness or visibility over the total number and types of ISR assets available to support combatant commanders or the capabilities represented by those assets. DOD uses an annual process for allocating or

distributing its available ISR assets, including UAS, to the combatant commanders to meet theater-level needs. That process is managed by U.S. Strategic Command's JFCC-ISR, which is tasked with making recommendations to the Secretary of Defense on how best to allocate DOD ISR resources for theater use across the combatant commands and ensuring the integration and synchronization of DOD, national, and allied ISR capabilities and collection efforts. DOD officials indicate that annual allocation levels are constrained by the number of ISR assets in DOD's inventory and believe that JFCC-ISR is, therefore, not able to allocate to the combatant commanders ISR assets in sufficient numbers to meet all requests for ISR support. However, our work suggests that additional information is needed to assess the true demand for ISR assets and the best way to meet this demand. Specifically, JFCC-ISR's ability to fulfill its mission of integrating DOD, national, and allied partner ISR capabilities and making recommendations on how best to allocate ISR assets to support the warfighter depends, in part, on the extent to which it has awareness and visibility over all ISR assets, including DOD, national, and allied ISR assets. JFCC-ISR does not have complete visibility into all assets that could be used to support combatant commanders' needs, which hinders its ability to optimally distribute or allocate DOD ISR assets. JFCC-ISR officials estimate it has 80–90 percent visibility into DOD ISR assets but does not have the same level of visibility into other national and allied ISR assets available to support theater-level requirements, such as assets that are owned and controlled by U.S. national intelligence agencies such as the National Security Agency or by our allies supporting ongoing operations. According to JFCC-ISR officials, although they are working to gain better visibility over all ISR assets, they currently do not have this level of visibility because DOD does not currently have a mechanism for obtaining information on all ISR assets—including all DOD, national, and allied assets—operating in each of the combatant commanders' area of operations. Absent such a mechanism, JFCC-ISR has been trying to learn more about the capabilities of non-DOD ISR assets by building relationships with other national and allied intelligence agencies and addressing limitations related to intelligence agency system access. Without an approach to its allocation process that considers all available ISR capabilities, JFCC-ISR does not have all the information it needs to leverage the capabilities of all available ISR assets and to optimize the allocation of DOD's ISR assets.

DOD Does Not Have Visibility over the Tasking of All DOD Airborne ISR Assets, Including UAS

DOD's process for tasking its airborne ISR assets, including UAS, does not provide for visibility at all levels into how DOD airborne ISR assets are being used on a daily basis. Once DOD ISR assets have been allocated, those assets are available to the combatant commanders to be assigned, or tasked, against specific requests for ISR support in ongoing operations. The JFACC is responsible for planning, coordinating, and monitoring joint air operations to focus the effect of air capabilities and for assuring their effective and efficient use in achieving the combatant commanders' objectives. However, while the JFACC has visibility into how all theater-level ISR assets, like the Air Force's Predator, are being used, he or she does not have visibility into how tactical ISR assets, such as the Army's Hunter, are being used on a daily basis or what missions they are supporting. The JFACC generally tasks assets that support theater-level objectives, while assets that support tactical-level objectives are tasked and controlled by the services or by the U.S. Special Operations Command. Tactical units utilize their embedded, or tactical, assets first to satisfy unit intelligence needs. However, when tactical assets are not available or capable of satisfying a unit's need for ISR support, the unit requests theater-level ISR support. Requests for most theater-level assets are entered into a central DOD database, but there is no similar database that captures requests for tactical-level assets. While there are procedures, such as the Air Tasking Order and Airspace Control Order, for tracking where theater- and tactical-level assets are operating for airspace control and deconfliction purposes, a comparable mechanism for tracking the missions these assets are supporting or how they are being used on a daily basis does not exist. For example, the Air Tasking Order would track the time, date, and location where a UAS was operating, but there is no mechanism that would track what intelligence the UAS was supposed to gather on a mission or why the UAS was being used on a mission. Without a database or similar mechanism providing visibility into how tactical-level assets are being tasked, the JFACC is limited in his or her awareness of how those assets are being used on a daily basis, which hinders the JFACC's ability to optimize the use of those assets.

This lack of visibility limits the JFACC's ability to leverage those assets using techniques such as cross-cueing, which is the collaborative effort of using capabilities offered by multiple ISR platforms to fulfill a mission. By using techniques such as cross-cueing, the JFACC has been able to use the different types of capabilities brought by different theater-level manned and unmanned ISR assets to maximize the intelligence collected. For example, a manned Joint Surveillance Target Attack Radar System was tasked to monitor an area. When this system sensed movement in the area, a Predator was then tasked to collect imagery to confirm suspected

activity. Without visibility into how tactical assets are being utilized, the JFACC is limited in his or her ability to optimize the use of all available DOD ISR assets and to focus the effect of these assets to ensure their efficient and effective use. Such visibility will become even more important given that services such as the Army are acquiring, and planning to embed in units, ISR assets capable of satisfying theater-level requirements, such as the Extended Range/Multi-Purpose or Warrior UAS, which could otherwise be leveraged to support JFACC requirements.

Duplicative taskings that occur are often driven by a lack of visibility into where ISR assets at all levels are operating and what they are tasked to do. For example, a DOD official shared with us an example of unnecessary duplication where an Army unit requested a full-motion video-capable asset to support a high-priority requirement. When the asset, a Predator UAS, arrived to support the requirement, its operator realized the Army unit had also tasked one of its tactical assets, a Hunter UAS, against the requirement. As a result of the lack of visibility over all assets, the potential exists for multiple ISR aircraft to be tasked to operate in the same area and against the same requirement. However, some level of duplication may be necessary when driven by mission requirements and system capabilities. Certain missions, such as special operations, often need a certain amount of duplication in order to achieve the desired result. For example, a mission intended to track activity of suspected terrorists may require multiple systems to follow identified individuals who flee the scene in different directions. Furthermore, assets such as the Predator UAS experience system limitations when equipped with a full-motion-video sensor in that they are only able to provide surveillance of a narrow or "soda straw" view. A certain level of duplication of UAS may be necessary to support a mission to obtain a complete view of the area under surveillance.

Greater visibility at the tactical level could provide units with a greater awareness of where other ISR assets, including both theater-level and those assets embedded in other units, are operating and what they are being used to do. A mechanism that provides this visibility would allow tactical units, when appropriate,[9] to leverage other assets operating in their area to optimize the information captured and avoid unnecessary duplicative taskings.

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[9]Some missions, such as special operations are classified and it is not always appropriate to share specifics of the missions.

DOD recognizes the opportunity to better plan for and control its ISR assets and has initiated a Persistent ISR Capabilities Based Assessment Study. The study, sponsored by the Battlespace Awareness Functional Capabilities Board, focuses on what other actions such as better planning, direction, command and control, and better fusion and exploitation of information can provide the warfighter with more persistent surveillance capability. The study is expected to be completed in the August–September 2007 time frame.

DOD Lacks Complete Metrics and Feedback for Fully Evaluating the Performance of Its ISR Assets to Ensure Warfighter's Needs Are Met

DOD is unable to fully evaluate the performance of its ISR assets because it lacks a complete set of metrics and does not consistently receive feedback from operators and intelligence personnel to ensure the warfighter's needs are met. Specifically, although JFCC-ISR is tasked with developing metrics and standards of performance to measure the success of DOD ISR missions, existing metrics are limited and no DOD-wide milestones have been established. Furthermore, DOD officials acknowledged that they do not consistently receive feedback from operators and intelligence analysts to ensure the warfighter's needs are met. Without feedback and a complete set of metrics for evaluating its ISR assets, DOD may not be in the best position to validate how well the warfighter needs are being met, the true demand for ISR assets, and whether it is optimizing the use of existing assets, or to acquire new systems that best support warfighting needs.

DOD Is Developing Metrics to Measure Success of Its ISR Assets, but Progress Has Been Limited and DOD Has Not Established Milestones

DOD is working to develop additional quantitative ISR metrics as well as qualitative metrics to measure the success of its ISR assets, but existing quantitative metrics are limited and no milestones have been established. The JFCC-ISR is tasked with developing metrics and standards of performance to assess DOD ISR mission accomplishment. Moreover, we recommended in a December 2005 report[10] that DOD ensure its performance measurement systems measure how effectively UAS perform their missions, identify performance indicator information that needs to be collected, and systematically collect identified performance information. We continue to believe this recommendation has merit, and DOD officials agree that metrics are needed not only for UAS, but for all ISR missions. However, DOD currently assesses its ISR missions with limited quantitative metrics such as the number of targets planned versus the

[10]GAO-06-49.

number collected against. While these metrics are a good start, DOD officials acknowledge that the current metrics do not take into account all of the qualitative considerations associated with measuring ISR asset effectiveness such as the cumulative knowledge provided by numerous ISR missions, whether the ISR asset did what it was intended to do, whether it had the intended effect, and whether the intelligence captured contributed towards accomplishment of the mission.

The JFCC-ISR is working with the combatant commands to develop additional quantitative ISR metrics as well as qualitative metrics to assess the effectiveness of ISR assets, although DOD officials acknowledge the progress in developing metrics has been limited. In developing these metrics, the JFCC-ISR is leveraging national intelligence attributes, which include characteristics such as whether the intelligence is comprehensive to perform all missions anywhere and at anytime in any weather; credible to allow users to make sound decisions and take appropriate action; persistent to collect often and long enough to get the job done; and timely to meet user needs. Furthermore, the JFCC-ISR has not made any progress in establishing DOD-wide milestones for the development of these metrics. Milestones are the required steps and planned dates for completion of those steps leading up to metrics development.

DOD officials indicate that determining the success of ISR missions is difficult given the nature of intelligence collection. Specifically, hundreds of hours of ISR missions and target tracking could culminate in the capture of a high value target; however, it may be difficult to measure the effectiveness of each individual ISR mission that led to the ultimate capture and mission success. This cumulative knowledge provided by ISR assets is difficult to quantify. An official from the Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics also acknowledged that it may be more difficult to evaluate the success of ongoing operations due to the dynamic and subjective nature of requirements. The official noted, however, that DOD is better equipped to measure the success of its more mature and traditional ISR missions, such as sensitive reconnaissance operations, because the objectives are better defined allowing more direct determination of success.

DOD Lacks Consistent Feedback on Whether ISR Assets Meet Warfighters' Needs

In addition to metrics, DOD also relies on feedback for evaluating how successful its ISR assets are in meeting the warfighter's needs. However, DOD lacks consistent feedback on whether ISR assets meet the needs of the warfighters. Joint Publication 2-01[11] calls for intelligence personnel and consumers to evaluate and provide immediate feedback on how well intelligence operations perform to meet commander's intelligence requirements. This information could be used to inform DOD's acquisition, allocation, and tasking of ISR assets. While DOD officials indicate they occasionally receive feedback on ISR asset performance, they acknowledge that feedback specific to how ISR assets performed in individual ISR missions is not consistently occurring. While there is real-time communication among unmanned aircraft system operators, requesters, and intelligence personnel during an operation, and agency officials indicate this communication is beneficial to providing real-time feedback, there is little to no feedback after the operation to determine whether the warfighters' needs were met. Officials indicate that the fast pace of operations in theater affects the ability of end users to provide feedback on every ISR mission. For example, according to Marine Corps officials, there is a mechanism for Marine Corps units to provide feedback, but the feedback is not consistently provided because there is no systematic process in place to ensure that this feedback is captured. Without developing metrics and systematically gathering feedback that enables it to assess the extent to which ISR assets are successful in supporting warfighter needs, DOD is not in a position to validate the true demand for ISR assets, determine whether it is allocating and tasking its ISR assets in the most effective manner, or acquire new systems that best support warfighting needs.

Conclusions

DOD has achieved operational success with UAS in ongoing operations, but it continues to face operational challenges that limit its ability to fully optimize the use of these assets. These operational challenges have been exacerbated by the lack of advance coordination when new assets are being deployed in theater. While operations in Iraq and Afghanistan have been ongoing for some time, the potential exists for DOD to need to establish operations in other areas of the world very quickly. A DOD-wide procedure for advance coordination is critical to enable DOD to quickly support ISR assets once deployed to ongoing operations. Until DOD takes

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[11]Joint Chiefs of Staff, Joint Publication 2-01, Joint and National Intelligence Support to Military Operations, page III-56 (Oct. 7, 2004).

steps to address the need for DOD-wide advance coordination, it may be limited in its ability to efficiently deploy and utilize UAS assets and may not allow the combatant commander time to plan to support incoming assets.

With the operational successes that have been realized with UAS, commanders are requesting them in greater numbers. In spite of a dramatic increase in UAS funding, DOD officials indicate that annual allocation levels are constrained by the number of ISR assets in the inventory and JFCC-ISR is, therefore, not able to allocate to the combatant commanders DOD ISR assets in sufficient numbers to meet all requests for ISR support. However, our work indicates that DOD's approach to UAS may not leverage all of the DOD ISR assets currently available and DOD may not be in the best position to determine if perceived demand is well-founded. Given the substantial investment DOD is making in UAS and the increasing demand for them, it is critical that DOD's approach to managing its ISR assets, including UAS, allow it to optimize the use of these assets. Without an approach to its allocation and tasking processes that considers all ISR capabilities, DOD may not be in a position to leverage all available ISR assets and to optimize the use of those assets. Moreover, DOD lacks visibility over the true demand for and use of ISR assets, which could hinder its ability to make informed decisions about the need to purchase additional UAS assets and what quantities should be purchased. Furthermore, without developing metrics and systematically gathering feedback that enables DOD to assess the extent to which ISR missions are successful in supporting warfighter needs, decision makers may not be in a position to determine which UAS systems would best support the warfighters' needs.

Recommendations for Executive Action

To mitigate challenges in integrating UAS, and other ISR assets, into combat operations, we recommend that the Secretary of Defense, in conjunction with the service secretaries and combatant commanders, take the following three actions:

- establish DOD-wide requirements for coordinating with the combatant commanders in advance of bringing UAS into the theater of operations;

- develop a plan for communicating those requirements throughout DOD; and

- establish a mechanism to ensure the services comply with these requirements.

To ensure DOD has the information needed to consider all ISR assets when allocating and tasking these assets, we recommend that the Secretary of Defense develop a mechanism for

- obtaining information on all ISR assets, including all DOD, national, and allied assets, operating in each of the combatant commanders' area of operations; and

- allowing users at all levels within DOD to gain real-time situational awareness on where DOD ISR assets are operating and, where not prohibited by the mission, what they are being used to do.

To improve DOD's ability to evaluate the performance of its ISR missions, we recommend the Secretary of Defense

- establish DOD-wide milestones for development of qualitative and quantitative metrics;

- develop a process for systematically capturing feedback from intelligence and operations communities to assess how effective ISR assets are in meeting warfighters' requirements; and

- create a mechanism to ensure this information is used to inform DOD's acquisition, allocation, and tasking of its ISR assets.

Agency Comments and Our Evaluation

In written comments on a draft of this report, DOD generally concurred with all of our recommendations. DOD generally agreed with our recommendation that the Secretary of Defense, in conjunction with the service secretaries and combatant commanders, establish DOD-wide requirements for coordinating with the combatant commanders in advance of bringing UAS into the theater of operations; develop a plan for communicating those requirements throughout DOD; and establish a mechanism to ensure the services comply with these requirements. DOD noted that it currently has a well-defined process to coordinate with the combatant commanders on the introduction of UAS into theater and cited several examples including the annual process for allocating theater-level UAS, and actions between stateside units and units in theater to plan for deployment of ISR capabilities. DOD, however, acknowledged that a more standardized method could improve efficiency of the coordination process and stated that the Joint Chiefs of Staff would be tasked to look at standardizing the coordination process and evaluate and provide direction

for an improved coordination process. Further, DOD noted that, based on this evaluation, if direction is required, it will be issued via a Chairman's directive which is mandatory and therefore establishes the mechanism that ensures compliance. We recognize that DOD has various processes related to UAS but note that none, including the examples cited by DOD, represent a standardized, DOD-wide approach that the services and combatant commanders can follow in coordinating the specific details of deploying UAS assets, regardless of geographic area. Furthermore, we believe that a directive requiring coordination, by itself, does not ensure compliance, and would encourage DOD to include provisions detailing how implementation of the directive will be monitored.

DOD also generally concurred with our recommendation that the Secretary of Defense develop a mechanism for obtaining information on all ISR assets—including all DOD, national, and allied assets—operating in each of the combatant commanders' area of operations; and allowing users at all levels within DOD to gain real-time situational awareness on where DOD ISR assets are operating and, where not prohibited by the mission, what they are being used to do. Specifically, DOD agrees that a mechanism for obtaining information on all ISR assets is needed and commented that work is underway within the JFCC-ISR to develop such a mechanism. DOD commented that it is not currently practical to provide situational awareness on some UAS such as the small, hand-launched UAS at the lowest operational level because these systems do not have the capacity or capability to communicate their position to a common point. DOD noted that it will determine the UAS operational levels that will provide widespread situational awareness, including operational details and timelines of data reporting. We recognize that situational awareness may not currently be practical for some UAS but would encourage the department to seek to maximize coverage in exploring options for improved situational awareness.

DOD concurred with our recommendation that the Secretary of Defense establish DOD-wide milestones for development of qualitative and quantitative metrics and stated that JFCC-ISR is standing up an Assessments Division that will be responsible for the development of metrics. We recognize the Assessment Division has been tasked with development of ISR metrics and reemphasize the need to develop milestones for metrics development. DOD partially concurred with our recommendations that it develop a process for systematically capturing feedback from intelligence and operations communities to assess how effective ISR assets are in meeting warfighters' requirements and create a mechanism to ensure this information is used to inform DOD's acquisition,

allocation, and tasking of its ISR assets. DOD agreed that an improved and standardized process for collection and reporting of feedback would enhance visibility and provide more effective warfighter support, but pointed out that organizations within the department collect feedback or conduct lessons learned studies. We acknowledge that DOD has organizations such as the Army's Center for Lessons Learned that are responsible for capturing feedback and developing lessons learned based on that feedback. However, these organizations are charged with capturing lessons learned on a number of issues and are not focused on ISR effectiveness. Furthermore, our recommendation pertains to DOD's guidance which states it is imperative that intelligence personnel and consumers to evaluate and provide immediate feedback on how well individual intelligence operations perform to meet commanders' intelligence requirements. While the feedback that may be captured by those lessons learned organizations is noteworthy, it is often not immediate and specific to individual missions. As we noted in our report, DOD officials acknowledged that feedback specific to how ISR assets performed in individual ISR missions is not consistently occurring. DOD further commented that it has mechanisms in place to inform its decision making processes on the acquisition, allocation, and tasking of its ISR assets such as the Joint Capabilities Integration and Development System which assesses, among other things, capability gaps and solutions. We agree that the mechanisms mentioned in DOD's response exist; however, DOD currently does not have sufficient qualitative and quantitative metrics needed to collect data on UAS performance nor does it have a means for incorporating such data into the processes currently used to make decisions on ISR assets.

The full text of DOD's written comments is reprinted in appendix II. DOD also provided technical comments separately and we have made adjustments where appropriate. In particular, the Army provided additional information on the coordination of the Warrior Alpha UAS in its technical comments, including a timeline for introduction of the asset into theater.

We are sending copies of this report to the Secretary of Defense. We will make copies available to others upon request. In addition, the report will be available at no charge on GAO's Web site at http://www.gao.gov. If you or your staff have any questions regarding this report, please contact me at (202) 512-9619 or pickups@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page

of this report. Staff members who made key contributions to this report are listed in appendix III.

Sharon L. Pickup

Sharon Pickup
Director, Defense Capabilities and Management

Appendix I: Scope and Methodology

To assess the extent to which the Department of Defense (DOD) has taken steps to facilitate the integration of unmanned aircraft systems (UAS) into combat operations, we examined DOD and military service publications and documentation on UAS such as the 2005–2030 UAS Roadmap, the Multi-Service Tactics, Techniques, and Procedures for the Tactical Employment of Unmanned Aircraft Systems, the Joint Concept of Operations for Unmanned Aircraft Systems, the Concept of Operations for Employment of Full Motion Video Assets, and the ISR Systems Concept of Operations Standardization Memo. Additionally, we met with key DOD and service officials, including those from the Joint UAS Center of Excellence and the Unmanned Aircraft Systems Planning Task Force within the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, and the Air Land Sea Application Center. We also met with officials from U.S. Central Command and the services, including units that had returned from deployment to the theater, or that were currently supporting ongoing operations, to discuss the integration of UAS into U.S. Central Command's area of responsibility and to better understand integration challenges.

To determine the extent to which DOD's approach to allocating and tasking its intelligence, surveillance, and reconnaissance (ISR) assets, including UAS, considers all available ISR assets to optimize their capabilities, we met with key DOD and service officials, including those from U.S. Central Command and associated Army and Air Force component commands, the Combined Air Operations Center at Al Udeid Air Base in Qatar, the Joint Functional Component Command for Intelligence, Surveillance, and Reconnaissance and other organizations. We interviewed and obtained documentation including the fiscal year 2007 ISR allocation briefing from officials of the Joint Functional Component Command for Intelligence, Surveillance, and Reconnaissance to better understand the allocation process. We also reviewed documentation such as joint publications and briefings that explain the process for tasking ISR assets and interviewed officials at U.S. Central Command, Central Command Air Forces, and the Combined Air Operations Center in Qatar to better understand how ISR assets are assigned to specific missions. To understand how requests for ISR support are generated and satisfied at the tactical level, we spoke with units that recently returned from, or are currently supporting, ongoing operations in Iraq as well as units within the services such as the Marine Corps' Tactical Fusion Center that are involved in determining if tactical assets are available to satisfy those requests or if the requests need to be forwarded for theater-level support. To understand how manned and unmanned assets are being leveraged to optimize the intelligence captured, we met with manned and unmanned

units stationed at the Al Dhafra Air Base in the United Arab Emirates. To understand DOD's ongoing efforts to study its process for tasking ISR assets, we reviewed documentation and interviewed an official from the Battlespace Awareness Functional Capabilities Board.

To assess whether DOD evaluates the performance of its ISR assets, including UAS, to ensure that warfighters' needs are met, we interviewed DOD and service officials to discuss the metrics for evaluating the performance of its ISR assets. We discussed with the Joint Functional Component Command for Intelligence, Surveillance, and Reconnaissance its efforts to establish metrics for evaluating ISR assets performance. We reviewed metrics routinely captured to assess the success of DOD's ISR missions. We also met with service officials and service units recently returned from Iraq to determine the extent to which feedback is received on how effective ISR support is in meeting the warfighters' needs. We performed our work from June 2006 to June 2007 in accordance with generally accepted government auditing standards.

Appendix II: Comments from the Department of Defense

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

JUN 2 1 2007

Ms. Sharon L. Pickup
Director, Defense Capabilities and Management
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Ms. Pickup:

This is the Department of Defense response to the GAO Draft Report, GAO-07-836, "UNMANNED AIRCRAFT SYSTEMS: Advance Coordination and Increased Visibility Needed to Optimize Capabilities," dated May 15, 2007 (GAO Code 350891).

The Department concurs with the draft report's recommendations 2, 4 (first bullet), and 5. The Department partially concurs with recommendations 1, 3, 4 (second bullet), 6, and 7. The rationale for the Department's position is enclosed.

The Department appreciates the opportunity to comment on the draft report. Technical comments were provided separately. For further questions concerning this report, please contact Mr. Dyke Weatherington at (703) 695-6188.

Sincerely,

David G. Ahern
Director
Portfolio Systems Acquisition

Enclosure:
As stated

GAO DRAFT REPORT – DATED MAY 15, 2007
GAO-07-836 (GAO CODE 350891)

"UNMANNED AIRCRAFT SYSTEMS: Advance Coordination and Increased Visibility
Needed to Optimize Capabilities"

DEPARTMENT OF DEFENSE COMMENTS
TO THE GAO RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommends that the Secretary of Defense, in
conjunction with the Service secretaries and Combatant Commanders, establish DoD-wide
requirements for coordinating with the Combatant Commanders in advance of bringing
unmanned aircraft systems into the theater of operations.

DoD RESPONSE: Partial Concur. The Department currently has a well defined process to
coordinate with the Combatant Commanders for introduction of programmed Unmanned
Aircraft Systems (UAS) into the specific theater of operations. Currently there are several
processes at the theater and organic levels, including ones to address Advanced Concept
Technology Demonstration/Joint Concept Technology Demonstration capabilities. The Global
Force Management Allocation process is used for theater-level assets (Global Hawk, Hunter,
Predator, and Reaper). For tactical-level UAS (Shadow, Raven, Pioneer), units conduct
planning actions with theater counterparts to include the intelligence, surveillance, and
reconnaissance (ISR) capabilities that will be deployed. Demonstration capabilities are
coordinated by the host unit and may follow either of the above processes. The Department
agrees that a more standardized method could improve efficiency of the coordination process,
while allowing for the wide range of UAS capabilities and levels of command. The Joint
Chiefs of Staff (JCS) will be tasked to look at standardizing the coordination process to
improve efficiency.

RECOMMENDATION 2: The GAO recommends that the Secretary of Defense, in
conjunction with the Service secretaries and Combatant Commanders, develop a plan for
communicating those requirements throughout DoD.

DoD RESPONSE: Concur. The Department concurs that during the coordination process,
specific Unmanned Aircraft Systems (UAS) requirements can be better articulated between the
Military Services and Combatant Commanders. The Joint Chiefs of Staff will be tasked to
evaluate and provide direction, if required, to the Military Services and Combatant
Commanders for an improved coordination process focused on theater operation-specific UAS
deployment requirements.

RECOMMENDATION 3: The GAO recommends that the Secretary of Defense, in
conjunction with the Service secretaries and Combatant Commanders, establish a mechanism to
ensure the Services comply with these requirements.

DoD RESPONSE: Partial Concur. Based on the Joint Chiefs of Staff evaluation, if direction is required, it will be provided through a Chairman's Directive, which is mandatory and therefore establishes the mechanism that ensures the Military Services comply with Unmanned Aircraft Systems requirements during coordination.

RECOMMENDATION 4: The GAO recommends that the Secretary of Defense develop a mechanism for:
- obtaining information on all intelligence, surveillance and reconnaissance assets, including all DoD, national, and allied assets operating in each of the Combatant Commander's area of operations; and
- allowing users at all levels within DoD to gain real-time situational awareness on where DoD intelligence, surveillance and reconnaissance assets are operating and, where not prohibited by the mission, what they are being used to do.

DoD RESPONSE:
Concur with the first bullet. This task is currently being undertaken by USSTRATCOM's Joint Functional Component Command – Intelligence, Surveillance, and Reconnaissance (JFCC-ISR). Partial Concur with the second bullet. Real-time situational awareness on small Unmanned Aircraft Systems (UAS) operations is currently not practical. These hand-launched systems are employed at the lowest operational level and as such, do not have the capacity or capability to feed their position to a common operational picture. The Department will determine the UAS operational levels that will provide wide-spread situational awareness, including operational details and timeliness of data reporting.

RECOMMENDATION 5: The GAO recommends that the Secretary of Defense establish DoD-wide milestones for development of qualitative and quantitative metrics.

DoD RESPONSE: Concur. The Joint Functional Component Command – Intelligence, Surveillance, and Reconnaissance is currently standing up an Assessments Division that will be responsible for development of metrics for Unmanned Aircraft Systems Intelligence, Surveillance, and Reconnaissance operations.

RECOMMENDATION 6: The GAO recommends that the Secretary of Defense develop a process for systematically capturing feedback from intelligence and operations communities to assess how effective intelligence, surveillance and reconnaissance assets are in meeting warfighters' requirements.

DoD RESPONSE: Partial Concur. The Department currently captures feedback from the Intelligence, Surveillance, and Reconnaissance operations across the range of Unmanned Aircraft Systems (UAS) capabilities. Organizations, such as the Joint Forces Command's Joint Warfare Center and the Army's Center for Army Lessons Learned, conduct ongoing feedback collection operations. Additionally, all the Military Services conduct their own lessons-learned studies. The Joint Staff's UAS Center of Excellence consolidates all the Military Services' feedback and makes it available across the DoD. The Department agrees that an improved and standardized collection and reporting process will enhance visibility across the range of UAS

process will enhance visibility across the range of UAS operations and allow better integration of all DoD capabilities to address shortfalls and provide more effective warfighter support.

RECOMMENDATION 7: The GAO recommends that the Secretary of Defense create a mechanism to ensure this information is used to inform DoD's acquisition, allocation, and tasking of its intelligence, surveillance and reconnaissance assets.

DoD RESPONSE: Partial Concur. There are already mechanisms in place to get information to DoD in regard to acquisition, allocation, and tasking of Intelligence, Surveillance, and Reconnaissance (ISR) assets. For acquisition, the Joint Capabilities Integration and Development Systems (JCIDS), Chairman of the Joint Chiefs of Staff Instruction 3170.01F, Capabilities Based Assessment is the DoD mechanism for assessing how well current and programmed warfighting systems are meeting required warfighter needs; determining capability gaps that require solutions, and determining the associated timeframes in which those solutions are required. In addition, JCIDS identifies potential Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities solutions. The Joint Unmanned Aircraft Systems (UAS) Materiel Review Board is the focal point within the JCIDS process to address specific joint UAS acquisition issues, including feedback from Combatant Commanders and Military Services. For allocation and tasking, there is a satisfaction/feedback "workbench" in place within the Planning tool for Resource Integration, Synchronization and Management collection management tool. With these types of mechanisms in place, the challenge for the Department becomes one of educating the ISR community that mechanisms exist, and continuing to improve timeliness and efficiency of the process.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Sharon L. Pickup, (202) 512-9619 or pickups@gao.gov

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Related GAO Products

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